Appendix C. Kings Beach Commercial Core Air Quality Technical Study

Kings Beach Commercial Core
Air Quality Technical Study

03-PLA-028
PM 9.19/10.27 (KP 14.79/16.53)
EA 03-OC9300

Prepared for:

MACTEC Engineering and Consulting
1572 E. College Parkway, Suite 162
Carson City, NV 89706
Contact: Bill Reich
775/888-9992

Prepared by:

Jones & Stokes
2600 V Street
Sacramento, CA 95818-1914
Contact: Tim Rimpo or Shannon Hatcher
916/737-3000

June 2005

Jones & Stokes. 2005. *Kings Beach Commercial Core Air Quality Technical Study*. June. (J&S 05045.05.) Sacramento, CA. Prepared for MACTEC Engineering and Consulting, Carson City, CA.

Contents

Page

Tables and Figures

Page

Table

Figure

Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
CAA	federal Clean Air Act
CAAQS	California ambient air quality standards
California CAA	California Clean Air Act
Caltrans	California Department of Transportation
CAP	clean air plan
CEQA	California Environmental Quality Act
CO	carbon monoxide
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
LTAB	Lake Tahoe Air Basin
MPO	metropolitan planning organization
NAAQS	National ambient air quality standards
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
PM10	particulate matter less than or equal to 10 microns in diameter
PM2.5	particulate matter less than or equal to 2.5 microns in diameter
ppm	parts per million
ROG	reactive organic gases
RTP	regional transportation plan
SIP	state implementation plan
SO_2	sulfur dioxide
SR	State Route
TAC	toxic air contaminant
TIP	transportation improvement plan
U.S. 50	U.S. Highway 50
VMT	vehicle miles traveled

Kings Beach Commercial Core

Air Quality Technical Study

Summary

This report discusses potential air quality impacts that could result from the construction of streetscape improvements for the State Route (SR) 28 commercial corridor in Kings Beach, California. This report also identifies preliminary mitigation measures necessary for the project alternatives to comply with local, state, and federal regulations, policies, and standards. This report will be used to support environmental documentation that will be prepared for the project in compliance with the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). Placer County is the state lead agency for CEQA compliance, and the Federal Highway Administration (FHWA), with the California Department of Transportation (Caltrans) as its representative, is the federal lead agency for NEPA compliance.

This report has been prepared to comply with Caltrans and FHWA transportation conformity requirements of Title 40, Part 50, and Title 40, Part 93, of the Code of Federal Regulations (CFR) and Placer County Air Pollution Control District (PCAPCD) and Tahoe Regional Planning Agency (TRPA) requirements for air quality.

Construction emissions of criteria pollutants, which include ozone precursors (reactive organic gases [ROG] and oxides of nitrogen [NO_x]), carbon monoxide (CO), and particulate matter less than or equal to 10 microns in diameter (PM10), were estimated using the Road Construction Emissions Model (Version 5.1).

Summer emissions of criteria pollutants resulting from vehicular activity were estimated using the California Air Resources Board's (ARB's) EMFAC2002 emission rate program, traffic data provided by the project traffic engineers, and guidance provided by TRPA. Because emissions of ozone precursors and temperature are directly related, the highest summer peak hour traffic conditions were modeled to estimate worst-case emissions of ozone precursors for the proposed project.

Localized increases in winter CO concentrations from vehicle congestion at intersections affected by development were modeled using the Caltrans CALINE4 line source dispersion model, ARB's EMFAC2002 emission rate program, traffic data provided by the project traffic engineers, and guidance

provided by TRPA. Because CO emissions and temperature are inversely related, the highest winter peak hour traffic conditions were modeled to estimate the worst-case CO concentrations for the proposed project.

The impacts and mitigation measures identified in the report are listed below:

- Impact 1: Generation of Construction-Related Emissions of Ozone Precursors (Reactive Organic Gases and Oxides of Nitrogen), Carbon Monoxide, and Particulate Matter in Excess of Placer County Air Pollution Control District Standards (Less than Significant with Mitigation Incorporated)
  - Mitigation Measure 1: Implement All Applicable Placer County Air Pollution Control District Best-Available Mitigation Measures
  - Mitigation Measure 2: Implement All Applicable Tahoe Regional Planning Agency Best Management Practices
  - Mitigation Measure 3: Implement California Department of Transportation Standard Specification 7-1.01F and Standard Specification 10
- Impact 2: Generation of Operation-Related Emissions of Ozone Precursors (Reactive Organic Gases and Oxides of Nitrogen), Carbon Monoxide, and Particulate Matter in Excess of Placer County Air Pollution Control District Standards (Less than Significant)
- Impact 3: Nonconformance with State Implementation Plan (Less than Significant)
- Impact 4: Generation of Carbon Monoxide Hotspot Emissions in Excess of the Federal or State Standards (Less than Significant)
- Impact 5: Exposure of Sensitive Receptors to Elevated Levels of Diesel Exhaust and an Increased Health Risk (Less than Significant)
- Impact 6: Atmospheric Deposition of Phosphorus from Re-Entrained Roadway Fugitive Dust into Lake Tahoe (Less than Significant)
- Impact 7: Generation of Significant Levels of Odors (Less than Significant)

Introduction and Project Description

This air quality technical study describes the environmental setting (existing conditions and regulatory setting) for air quality relating to the proposed project, the impacts on air quality that would result from the proposed project, and mitigation measures that would reduce these impacts.

Placer County is developing a plan to implement streetscape improvements for the SR 28 commercial corridor in Kings Beach, California. Placer County is considering several alternatives for the proposed project, which are described below:

- **Alternative 1:** Under Alternative 1, SR 28 would be modified from a four-lane cross section roadway to a three-lane cross section roadway. Roundabouts would be located at the SR 28 intersections with SR 267, Bear Street, and Coon Street. On-street parking would be allowed on both sides of SR 28 in winter but prohibited during summer.
- **Alternative 2:** Under Alternative 2, SR 28 will remain a four-lane cross section roadway with traffic signals at SR 267, Bear Street, and Coon Street. At Fox Street, left-turn lanes would be provided. On-street parking would be allowed on both sides of SR 28 during the entire year.
- **Alternative 3:** This alternative is identical to Alternative 1, except that on-street parking would be prohibited during the entire year.
- **Alternative 4:** Under Alternative 4, SR 28 would be modified to two westbound travel lanes and one eastbound travel lane. A center turn lane would be provided, and roundabouts would be located at the SR 28 intersections with SR 267, Bear Street, and Coon Street. On-street parking would be located on the westbound side of SR 28 but prohibited on the eastbound side.

Environmental Setting

Regional Climate and Meteorology

The proposed project is located within the Placer County portion of the Lake Tahoe Air Basin (LTAB). The PCAPCD, within which the proposed project is located, and the El Dorado County Air Pollution Control District make up the LTAB. These districts work together to employ a regional approach to air pollution control.

The LTAB comprises the surface of Lake Tahoe and the land up to the surrounding rim of mountain ridges, occupying approximately 193 square miles. Its average elevation is 6,200 feet. Deep valleys that have been carved by streams that drain into the lake break the precipitous mountain slopes surrounding the lake.

In winter, the meteorology of the LTAB is typified by large amounts of precipitation from Pacific storms that falls mainly as snow, with temperatures often below freezing, accompanied by winds, cloudiness, and lake and valley fog. Winter days can be cool and brilliantly clear between storms. In summer, days are often mild and sunny, with daytime peaks in the upper 70s and low 80s (degrees Fahrenheit), with southern flows of moisture bringing an occasional thunderstorm.

The principal impact on air quality from these conditions is excess wintertime concentrations of CO in the more congested and populated areas of the basin. This is seen primarily at South Lake Tahoe from the operation of vehicles, residential wood stoves, and fireplaces. Some transport of ozone from the west

in summer is also known to occur, but the ARB has not yet officially recognized this as a transport route.

Criteria Pollutants and Local Air Quality

Pollutants of Concern in the Lake Tahoe Region

The federal and state governments have established ambient air quality standards for seven criteria pollutants: ozone, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM10, particulate matter less than 2.5 microns in diameter (PM2.5), and lead. The state has also established standards for hydrogen sulfide, vinyl chloride, and sulfates. National and California ambient air quality standards (NAAQS and CAAQS, respectively) are shown in Table 1.

Ozone and NO_2 (an ozone precursor) are considered regional pollutants because they affect air quality on a regional scale; oxides of nitrogen, including NO_2, reacts photochemically with ROG to form ozone some distance downwind of the source of pollutants. Pollutants such as CO, PM10, and PM2.5 are considered local pollutants because they tend to disperse rapidly with distance from the source. The health effects of the pollutants of concern in the project area are discussed below.

Ozone

Ozone is a severe eye, nose, and throat irritant that increases susceptibility to respiratory infections. Ozone causes extensive damage to plants through leaf discoloration and cell damage. Ozone also attacks synthetic rubber, textiles, and other materials. Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. Mobile sources and stationary combustion equipment emit ozone precursors (ROG and NO_x).

Carbon Monoxide

CO is essentially inert to plants and materials, but can have significant effects on human health. CO combines readily with hemoglobin and thereby reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Table 1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria		Attainment Status of Placer County	
			California	National	California	National	California	National	California	National
Ozone*	O_3	1 hour	0.09	–	180	–	If exceeded	–	Attainment	–
		8 hours	0.07	0.08	–	157	If exceeded	If fourth highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor within an area	–	Unclassified/ attainment
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year	Attainment	Unclassified/ attainment
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year	Attainment	Unclassified/ attainment
(Lake Tahoe only)		8 hours	6	–	7,000	–	If equaled or exceeded	–	Attainment	–
Nitrogen dioxide	NO_2	Annual average	–	0.053	–	100	–	If exceeded on more than 1 day per year	–	Unclassified/ attainment
		1 hour	0.25	–	470	–	If exceeded	–	Attainment	–
Sulfur dioxide	SO_2	Annual average	–	0.03	–	80	–	If exceeded	–	Attainment
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year	Attainment	Attainment
		1 hour	0.25	–	655	–	If exceeded	–	–	–
Hydrogen sulfide	H_2S	1 hour	0.03	–	42	–	If equaled or exceeded	–	Unclassified	–
Vinyl chloride	C_2H_3Cl	24 hours	0.01	–	26	–	If equaled or exceeded	–	No designation	–
Inhalable particulate matter	PM10	Annual geometric mean	–	–	20	–	If exceeded	–	Nonattainment	–
		Annual arithmetic mean	–	–	–	50	–	If exceeded at each monitor within area	–	Unclassified
		24 hours	–	–	50	150	If exceeded	If exceeded on more than 1 day per year	Nonattainment	Unclassified

Table 1. Continued

Pollutant	Symbol	Average Time	Standard (parts per million)			Standard (micrograms per cubic meter)			Violation Criteria			Attainment Status of Placer County	
			California	National		California	National		California	National		California	National
	PM2.5	Annual geometric mean	–	–		12	–		If exceeded	–		Unclassified	–
		Annual arithmetic mean	–	–		–	15		–	If 3-year average from single or multiple community-oriented monitors is exceeded		–	No designation
		24 hours	–	–		–	65		–	If 3-year average of 98th percentile at each population-oriented monitor within an area is exceeded		–	No designation
Sulfate particles	SO_4	24 hours	–	–		25	–		If equaled or exceeded	–		Attainment	–
Lead particles	Pb	Calendar quarter	–	–		–	1.5		–	If exceeded no more than 1 day per year		–	No designation
		30-day average	–	–		1.5	–		If equaled or exceeded	–		Attainment	–

Notes: All standards are based on measurements at 25ºC and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
– = not applicable.

* The U.S. Environmental Protection Agency recently replaced the 1-hour ozone standard with an 8-hour standard of 0.08 part per million. EPA issued a final rule that will revoke the 1-hour standard on June 15, 2005. However, the California 1-hour ozone standard will remain in effect.

Source: California Air Resources Board 2003.

Inhalable Particulate Matter

Federal and state ambient air quality standards for particulate matter apply to two classes of particulates: PM2.5 and PM10. Particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials.

Sulfur Oxides

Sulfur oxide gases are a family of colorless, pungent gases, which include SO_2 and are formed primarily by combustion of sulfur-containing fossil fuels (mainly coal and oil), metal smelting, and other industrial processes. Sulfur oxides can react to form sulfates, which significantly reduce visibility. The major health concerns associated with exposure to high concentrations of sulfur oxides include effects on breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Emissions of sulfur oxides can also damage tree foliage and agricultural crops. Together, sulfur oxides and nitrogen oxides are the major precursors to acid rain, which is associated with the acidification of lakes and streams and with the accelerated corrosion of buildings and monuments.

Vinyl Chloride

Vinyl chloride is a sweet-smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and polyvinyl chloride production are the major identified sources of vinyl chloride emissions in California. Polyvinyl chloride can be fabricated into several products such as pipes, pipe fittings, and plastics. In humans, epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer (liver angiosarcoma) and have suggested a relationship between exposure and lung and brain cancers.

Lead

Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used several decades ago to increase the octane rating in gasoline; therefore, gasoline-powered automobile engines were a major source of airborne lead. Because the use of leaded fuel has been mostly phased out, ambient concentrations of lead have dropped dramatically. Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma, or even death. However, even small amounts of lead can be harmful, especially to infants, young children, and pregnant women.

Hydrogen Sulfide

Hydrogen sulfide gas is colorless, with a characteristic odor of rotten eggs. Atmospheric hydrogen sulfide is primarily oxidized to SO_2, which is eventually converted into sulfate, then sulfuric acid. When sulfuric acid is transported back to the earth through "acid rain," it can damage plant tissue and aquatic ecosystems. Hydrogen sulfide is primarily associated with geothermal activity and oil production activities. It can cause dizziness, irritation to the eyes, mucous membranes, and respiratory tract; nausea; and headaches at low concentrations. Exposure to higher concentrations (above 100 parts per million [ppm]), can cause olfactory fatigue, respiratory paralysis, and death.

Toxic Air Contaminants

Toxic air contaminants (TACs) are pollutants that may result in an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. In 1998, following a 10-year scientific assessment process, the ARB identified particulate matter from diesel-fueled engines as a TAC. Compared to other air toxics that the ARB has identified and controlled, diesel particulate matter emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000).

Existing Air Quality Conditions

The existing air quality conditions in the project area can be characterized by monitoring data collected in the region. Within the LTAB, ozone, CO, PM10, and PM2.5 are monitored at the Echo Summit and South Lake Tahoe monitoring stations, and ozone and CO are monitored at the Tahoe City monitoring station. Table 2 summarizes air quality data from these monitoring stations for 2002 to 2004. As shown, during the 3-year monitoring period, the monitoring stations in the vicinity of the project area have experienced occasional violations of several ambient air quality standards. Placer County's attainment status for each ambient air quality standard is shown in Table 1.

Sensitive Receptors

Sensitive receptors are locations where human populations, especially children, seniors, and sick persons are located where there is reasonable expectation of continuous human exposure according to the averaging time for an air quality standard (e.g., 24-hour, 8-hour, 1-hour). These typically include residences, hospitals, and schools. Residences are scattered throughout the vicinity of the project area.

Table 2. Ambient Air Quality Monitoring Data Measured at the Echo Summit, South Lake Tahoe, and Tahoe City Monitoring Stations

Pollutant Standards	Echo Summit			South Lake Tahoe			Tahoe City		
	2002	2003	2004	2002	2003	2004	2002	2003	2004
Ozone									
Maximum 1-hour concentration (ppm)	0.102	0.082	0.096	0.083	0.075	0.066	–	0.086	0.065
Maximum 8-hour concentration (ppm)	0.079	0.079	0.082	0.079	0.066	0.058	–	0.070	0.061
Number of days standard exceeded[a]									
NAAQS 1-hour (>0.12 ppm)	0	0	0	0	0	0	0	0	0
CAAQS 1-hour (>0.09 ppm)	1	0	1	0	0	0	0	0	0
NAAQS 8-hour (>0.08 ppm)	0	0	0	0	0	0	0	0	0
Carbon Monoxide (CO)									
Maximum 8-hour concentration (ppm)	0.77	1.86	4.35	3.04	1.51	1.18	–	0.81	0.53
Maximum 1-hour concentration (ppm)	2.5	2.4	6.1	3.8	2.4	2.2	–	1.4	.9
Number of days standard exceeded[a]									
NAAQS 8-hour (≥9.0 ppm)	0	0	0	0	0	0	–	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0	0	0	0	–	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0	0	0	0	–	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0	0	0	0	–	0	0
Particulate Matter (PM10)[b]									
National[c] maximum 24-hour concentration ($\mu g/m^3$)	29.0	46.0	24.0	51.0	61.0	130.0	–	–	–
National[c] second-highest 24-hour concentration ($\mu g/m^3$)	22.0	22.0	23.0	45.0	41.0	121.0	–	–	–
State[d] maximum 24-hour concentration ($\mu g/m^3$)	23.0	36.0	19.0	46.0	52.0	112.0	–	–	–
State[d] second-highest 24-hour concentration ($\mu g/m^3$)	18.0	18.0	18.0	40.0	36.0	102.0	–	–	–
National annual average concentration ($\mu g/m^3$)	9.1	7.9	–	19.9	17.6	44.2	–	–	–
State annual average concentration ($\mu g/m^3$)[e]	7.3	6.3	–	17.1	15.0	37.5	–	–	–
Number of days standard exceeded[a]									
NAAQS 24-hour (>150 $\mu g/m^3$)[f]	0	0	0	0	0	0	–	–	–
CAAQS 24-hour (>50 $\mu g/m^3$)[f]	0	0	0	0	6.1	99.2	–	–	–
Particulate Matter (PM2.5)									
National[c] maximum 24-hour concentration ($\mu g/m^3$)	1.0	–	–	27.0	21.0	20.0	–	–	–
National[c] second-highest 24-hour concentration ($\mu g/m^3$)	1.0	–	–	22.0	19.0	16.0	–	–	–

Table 2. Continued

Pollutant Standards	Echo Summit			South Lake Tahoe			Tahoe City		
	2002	**2003**	**2004**	**2002**	**2003**	**2004**	**2002**	**2003**	**2004**
State[d] maximum 24-hour concentration (μg/m^3)	1.0	–	–	27.0	24.0	23.2	–	–	–
State[d] second-highest 24-hour concentration (μg/m^3)	1.0	–	–	22.0	23.6	17.5	–	–	–
National[b] annual average concentration (μg/m^3)	–	–	–	–	7.2	–	–	–	–
State[c] annual average concentration (μg/m^3) [e]	–	–	–	–	7.2	–	–	–	–
Number of days standard exceeded[a]									
NAAQS 24-hour (>65 μg/m^3)	0	–	–	0	0	0	–	–	–

Notes: CAAQS = California ambient air quality standards.
NAAQS = national ambient air quality standards.
– = insufficient data available to determine the value.

[a] An exceedance is not necessarily a violation.

[b] Measurements usually are collected every 6 days.

[c] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[d] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, State statistics are based on California approved samplers.

[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.

Sources: California Air Resources Board 2004; U.S. Environmental Protection Agency 2005.

Regulatory Setting

The air quality management agencies of direct importance in Placer County include the U.S. Environmental Protection Agency (EPA), ARB, PCAPCD, and TRPA. The EPA establishes NAAQS for which ARB and PCAPCD have primary implementation responsibility.

The ARB and PCAPCD are responsible for ensuring that CAAQS are met. The ARB oversees the activities of the local air districts, but it does not permit stationary sources of air pollutants, which is the responsibility of the local air districts. The ARB has the authority for setting vehicle emissions standards for on-road vehicles and for some off-road vehicles. The ARB also identifies and sets control measures for TACs.

The PCAPCD is responsible for implementing strategies for air quality improvement and recommending mitigation measures for new growth and development. It also adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs and regulated agricultural burning. Other PCAPCD responsibilities include monitoring air quality, preparation of clean air plans, and responding to citizen air quality complaints. In addition to planning responsibilities, the PCAPCD has permitting authority over stationary sources of pollutants. Authority over mobile sources of pollutants is given to the ARB.

As the local metropolitan planning organization (MPO) for the region, the TRPA is responsible for planning within the Lake Tahoe region and oversees development at Lake Tahoe. TRPA has the authority to adopt environmental quality thresholds, and to enforce ordinances designed to achieve the thresholds.

Federal Requirements

Federal Clean Air Act

The federal Clean Air Act (CAA), enacted in 1970 and amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The EPA establishes NAAQS for several criteria pollutants: CO, NO_2, SO_2, ozone, PM10, PM2.5, and lead (Table 1). Most standards are set to protect public health, but some are based on other values (e.g., protection of crops, protection of materials, or avoidance of nuisance conditions). The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for NAAQS. The SIP, which is reviewed and approved by the EPA, must demonstrate how the NAAQS will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits. If the SIP submitted by the state fails to demonstrate achievement of the standards, the EPA must prepare a federal implementation plan.

Transportation Conformity Requirements

The concept of transportation conformity was introduced in the 1977 CAA, which includes a provision to ensure that transportation investments conform to the SIPs for meeting NAAQS. Conformity requirements were made substantially more rigorous in the Clean Air Act Amendments of 1990, and the transportation conformity regulation that details implementation of the new requirements was issued in November 1993. Typically, evaluating whether a project is included in a conforming regional transportation plan (RTP) or transportation improvement plan (TIP) is done to determine transportation conformity for ozone precursors. Because PM10 and CO are localized pollutants, the determination of transportation conformity for these pollutants is assessed by identifying whether the proposed project would generate elevated "hotspot" concentrations. The determination of conformity for PM10 is qualitative, and the determination for CO is quantitative.

State Requirements

The California Clean Air Act (California CAA) requires local and regional air pollution control districts that are not attaining one or more of the CAAQS for ozone, CO, SO_2, or NO_2 to expeditiously adopt district-level air quality management plans, called clean air plans (CAPs), that are specifically designed to attain these standards. Each CAP must be designed to achieve an annual 5% reduction in districtwide emissions of each nonattainment pollutant or its precursors, and they must be updated every 3 years. The ARB is responsible for developing plans and projects that achieve compliance with the state PM10 standards. Although there are state ambient standards for lead, sulfates, vinyl chloride, and hydrogen sulfide, the California CAA does not require that CAPs be developed for them.

Local Requirements

Placer County Air Pollution Control District

The proposed project would be subject to the following PCAPCD rules, which have been adopted by the PCAPCD to reduce emissions throughout Placer County and are required:

- **Rule 202: Visible Emissions.** The purpose of Rule 202 is to establish limits regarding the opacity of emissions.
- **Rule 205: Nuisance.** The purpose of Rule 205 is to limit emissions of any substance that would cause a nuisance to the public.
- **Rule 207: Particulate Matter.** The purpose of Rule 207 is to establish limits regarding the emissions of particulate matter.

- **Rule 228: Fugitive Dust.** The purpose of Rule 228 is to reduce the amount of particulate matter entrained and discharged into the air by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. This rule also applies to construction activities.
- **Rule 242: Stationary Internal Combustion Engines.** The purpose of Rule 242 is to limit the emission of NO_x and CO from stationary internal combustion engines. This rule would apply to any internal combustion engines rated at more than 50 brake horsepower operating more than 200 hours per year. This rule would apply to construction activities that occur for more than 200 hours per year.
- **Rule 501: General Permit Requirements.** The purpose of Rule 501 is to provide an orderly procedure for the review of new sources of air pollution and the orderly review of the modification and operation of existing sources through the issuance of permits. This rule does not apply to internal combustion engines with a manufacturer's maximum continuous rating of 50 brake horsepower or less, or to gas turbine engines with a maximum heat input rate of 3,000,000 British thermal units per hour or less at ISO [International Organization for Standardization] standard day conditions (288 degrees Kelvin, 60% relative humidity, 101.3 kilopascals pressure).
- **Rule 509: Transportation Conformity.** Rule 509 summarizes the requirements for the conformity of transportation plans, programs, and projects developed, funded, or approved under U.S. Government Code Title 23 or the Federal Transit Act to state or federal implementation plans.

Tahoe Regional Planning Agency

The TRPA has developed eight regional thresholds/indicators with the goal of protecting the air quality in the Lake Tahoe region. These goals are summarized below:

- **AQ-1: Carbon Monoxide.** CO levels shall not meet or exceed the TRPA 8-hour 6.0-ppm standard. The indicative value for attainment of this standard is the second-highest CO concentration that is read at the Stateline, Nevada, station (ppm).
- **AQ-2: Ozone.** Ozone levels shall not exceed the TRPA 1-hour standard of 0.08 ppm. Attainment is based on the number of 1-hour periods, which equal or exceed the federal, Nevada, or TRPA standard at any of the permanent monitoring sites (unitless), and the number of 1-hour periods that exceed the California standard.
- **AQ-3: Particulate Matter.** Particulate matter concentrations shall not exceed the California and federal standards for 24-hour concentrations (50 and 150 micrograms per cubic meter [$\mu g/m^3$], respectively) and the annual average (30 and 50 $\mu g/m^3$, respectively). Attainment is based on the number of 24-hour periods exceeding the applicable federal or state standards at any permanent monitoring station (unitless) and the annual average PM10 concentration at any monitoring station ($\mu g/m^3$).

- **AQ-4: Visibility.** TRPA's regional and subregional visibility standards shall not be violated. In addition, for regional and subregional visibility, wood smoke concentrations shall be reduced 15% below the 1981 levels for subregional visibility. Suspended soil particles shall be reduced 30% below the 1981 levels. For regional visibility, visual range is calculated from aerosol data gathered at the D. L. Bliss State Park monitoring site. For subregional visibility, visibility is calculated from aerosol data gathered at the Lake Tahoe Boulevard station. For state visibility standards, visual range is calculated from nephelometer data collected at Bliss State Park and Lake Tahoe Boulevard for periods in which relative humidity is less than 70% (miles).
- **AQ-5: Traffic Volume.** There shall be a 7% reduction in traffic volume on the U.S. Highway 50 (U.S. 50) corridor from the 1981 values. The standard uses the average traffic volume from 4 p.m. to midnight from November through February. Traffic volumes on U.S. 50, recorded at a site immediately west of the intersection of Park Avenue in the City of South Lake Tahoe, include a count of both directions during an average day. TRPA selected this indicator because the threshold appears in TRPA Resolution 82-11, under the heading "Carbon Monoxide," and historically this has been the location of the only existing CO hotspot in the region, which occurred during the winter months.
- **AQ-6: Wood Smoke.** Annual emissions from wood smoke shall be reduced 15% from 1981 levels. There are currently no scientifically sound direct measurements for wood smoke; however, indicative aerosol constituents are used to analyze wood smoke trends.
- **AQ-7: Vehicle Miles Traveled.** Vehicle miles traveled (VMT) shall be reduced 10% below the 1981 levels. Typically, VMT is calculated directly from a traffic model. However, for the purposes of the 2001 Threshold Evaluation, TRPA utilized the 1995 VMT estimate from the TranPlan traffic model and applied a factor to account for actual increases in traffic volumes from 1995 through 1999. Actual current traffic volumes were closer to the 1995 TranPlan–generated traffic volumes than they were to the 2001 forecasted traffic volumes. A factor was then developed comparing the 1995 model-generated traffic volumes to the current actual volumes. This relationship was then applied to the 1995 VMT estimate to account for increase in traffic in that time period and estimate the current year VMT.
- **AQ-8: Particulate Matter.** Dissolved inorganic nitrogen load on Lake Tahoe from atmospheric sources shall be reduced by approximately 20% of the 1973–1981 annual average. Load is calculated using the annual average concentrations of particulate NO_3 at the Lake Tahoe Boulevard air quality monitoring station ($\mu g/m^3$) and the annual average concentrations of NO_2 at a Stateline, Nevada, monitoring station. This monitoring station was relocated in 1998; therefore, the annual average concentrations from a Sandy Way, South Lake Tahoe, station are used to determine attainment.

Impact and Mitigation

This section describes the proposed project's impacts on air quality. First, describes the methods used to determine the proposed project's impacts associated with construction (temporary, short-term) and operation (permanent, long-term). Second, it lists the thresholds used to conclude whether an impact would be significant. Third, it describes each impact and any mitigation measures that would be implemented.

Methodology

Construction

Construction emissions of ROG, NO_x, CO, and PM10 were estimated using the Road Construction Emissions Model (Version 5.1). The road construction model is a public-domain spreadsheet model formatted as a series of individual worksheets. The model enables users to estimate emissions using a minimum amount of project-specific information. The model estimates emissions for load hauling (on-road heavy-duty vehicle trips), worker commute trips, construction site fugitive PM10 dust, and off-road construction vehicles. This analysis is based on anticipated construction equipment calculated by the Road Construction Emissions Model, which estimates construction equipment based on project size, duration of construction activities, and level of daily construction activities. Although exhaust emissions are estimated for each activity, fugitive dust estimates are currently limited to the major dust-generating activities, which include grubbing/land clearing and grading/excavation.

The amount of pollutants emitted during construction activities varies greatly depending on the level of activity, specific operations taking place, equipment being operated, soil characteristics, and weather conditions. Despite this variability in emissions, experience has shown that several feasible control measures can be reasonably implemented to reduce PM10 emissions from fugitive dust and equipment exhaust emissions during construction.

Operation

Emissions of Criteria Pollutants

Vehicle Emission Rates

Vehicle emission rates were determined using the ARB's EMFAC2002 emission rate program. Free-flow traffic speeds were adjusted to reflect congested speeds using methodology from the *Highway Capacity Manual* (Transportation Research Board 2000), and particulate matter estimates incorporated emissions from brake and tire wear. Guidance provided by TRPA staff indicates that Lake Tahoe's environment and economy result in a local climate and residential/visitor population that is rather different than those parts of the counties that are outside

the basin and other areas in California. Specifically, default data included in the EMFAC2002 regarding fleet mix does not accurately represent the meteorological data and actual mix of vehicles present in the Tahoe area (Quashnick pers. comm.). As a result, the default fleet mix for the Lake Tahoe region was replaced with area-specific data provided by the TRPA. Because emissions of ozone precursors and temperature are directly related, the highest summer peak hour traffic conditions were modeled to estimate worst-case emissions of ozone precursors for the proposed project.

Roadway and Traffic Conditions

Traffic volumes and operating conditions used in the modeling were obtained from the traffic analysis prepared by the project traffic engineers (LSC Transportation Consultants 2003; Shaw pers. comm.). Emissions of ozone precursors (ROG and NO_x), CO, and PM10 for existing and future year (2028) project conditions under each alternative were modeled using EMFAC2002. Interim year (2008) emissions of criteria pollutants were not estimated because future year (2028) conditions represent final project buildout conditions. Emissions for peak hour and non-peak hour conditions were estimated to obtain overall daily emissions. For this analysis, the roadway network was assumed to operate at a daily average of level of service A for non-peak hour conditions. In addition, the proposed project is not a traffic-generating project and would not result in differences in traffic volumes throughout the project area between project and no-project conditions.

Carbon Monoxide Impacts at Congested Intersections

CALINE4 Model

Localized increases in CO concentrations from vehicle congestion at intersections affected by development were modeled using the California Department of Transportation (Caltrans) CALINE4 line source dispersion model (Benson 1989). CALINE4 is a Gaussian dispersion model specifically designed to evaluate air quality impacts of roadway projects. Each roadway segment analyzed in the model is treated as a sequence of "links." CALINE4 uses worst-case meteorological data to predict a concentration that would never be exceeded, thus producing a conservative estimate of a project's potential impacts. Because CO emissions and temperature are inversely related, the highest winter peak hour traffic conditions were modeled to estimate the worst-case CO concentrations for the proposed project.

Roadway and Traffic Conditions

Traffic volumes and operating conditions used in the modeling were obtained from the traffic analysis prepared by the project traffic engineers (LSC Transportation Consultants 2003; Shaw pers. comm.). Ambient CO concentrations near the roadway for existing, interim year (2008), and future year (2028) project conditions under each alternative were modeled using CALINE4. The intersections of SR 28/SR 267, SR 28/Secline Street, SR 28/Deer Street, SR 28/Bear Street, SR 28/Coon Street, SR 28/Fox Street, and SR 28/Chipmunk Street were modeled to assess CO impacts.

Vehicle Emission Rates

Vehicle emission rates were determined using the ARB's EMFAC2002 emission rate program. Free-flow traffic speeds were adjusted to reflect congested speeds using methodology from the *Highway Capacity Manual* (Transportation Research Board 2000). As indicated above, the TRPA has identified Lake Tahoe as having a local climate and residential/visitor population that is rather different than the parts of the counties that are outside the basin and other areas in California. Therefore, the default fleet mix and meteorological data for the Lake Tahoe region were replaced with area-specific data provided by the TRPA (Quashnick pers. comm.).

Receptor Locations

CO concentrations were estimated at locations representing the nearest sensitive receptors in the vicinity of the intersections of SR 28/SR 267, SR 28/Secline Street, SR 28/Deer Street, SR 28/Bear Street, SR 28/Coon Street, SR 28/Fox Street, and SR 28/Chipmunk Street. In addition, receptors were modeled at locations throughout the project area representing the residential land uses situated off SR 28, along the roadways parallel to SR 28. Table 3 and Figure 1 indicate the locations of modeled receptors in the project area. Receptors were chosen based on the CO protocol developed for Caltrans (Garza et al. 1997). Receptor heights were set at 5.9 feet.

Table 3. General Locations of Receptors

Receptor Positions	General Location
1A to 1C	Intersection of SR 28/SR 267
2A to 2D	Intersection of SR 28/Secline Street
3A to 3 D	Intersection of SR 28/Deer Street
4A to 4D	Intersection of SR 28/Bear Street
5A to 5E	Intersection of SR 28/Coon Street
6A to 6E	Intersection of SR 28/Fox Street
7A to 7C	Intersection of SR 28/Chipmunk Street
A1	South of SR 267
B1 to B3	Between SR 267 and Secline Street
C1 to C7	Between Secline Street and Deer Street
D1 to D4	Between Deer Street and Bear Street
E1 to E4	Between Bear Street and Coon Street
F1 to F9	Between Coon Street and Fox Street
G1 to G12	Between Fox Street and Chipmunk Street
H1 to H6	East of Chipmunk Street
Note: Refer to Figure 1 for receptor locations.	

Meteorological Conditions

Meteorological inputs to the CALINE4 model were determined using methodology recommended in the CO protocol (Garza et al. 1997). The meteorological conditions used represent a calm winter period. The worst-case wind angles option was used to determine a worst-case concentration for each

receptor. The meteorological inputs include: 1.0 meter per second wind speed, ground-level temperature inversion (atmospheric stability class G), wind direction standard deviation equal to 30°F, ambient temperature of 30°F, altitude above sea level of 6,280 feet, and a mixing height of 1,000 meters.

Background Concentrations and 8-Hour Values

To account for sources of ambient CO not included in the modeling, 1- and 8-hour background concentrations of 1.2 and 0.7 ppm, respectively, were added to the modeled 1-hour and 8-hour values for existing and future years. These values represent the average highest monitored values over the last 2 years that data is available at the closest monitoring station (Tahoe City). Actual 1- and 8-hour background concentrations in future years would likely be lower than those used in the CO modeling analysis because the trend in CO emissions and concentrations is decreasing because of continuing improvements in engine technology and the retirement of older, higher-emitting vehicles. Modeled 8-hour values were calculated from the 1-hour values using a persistence factor of 0.6.

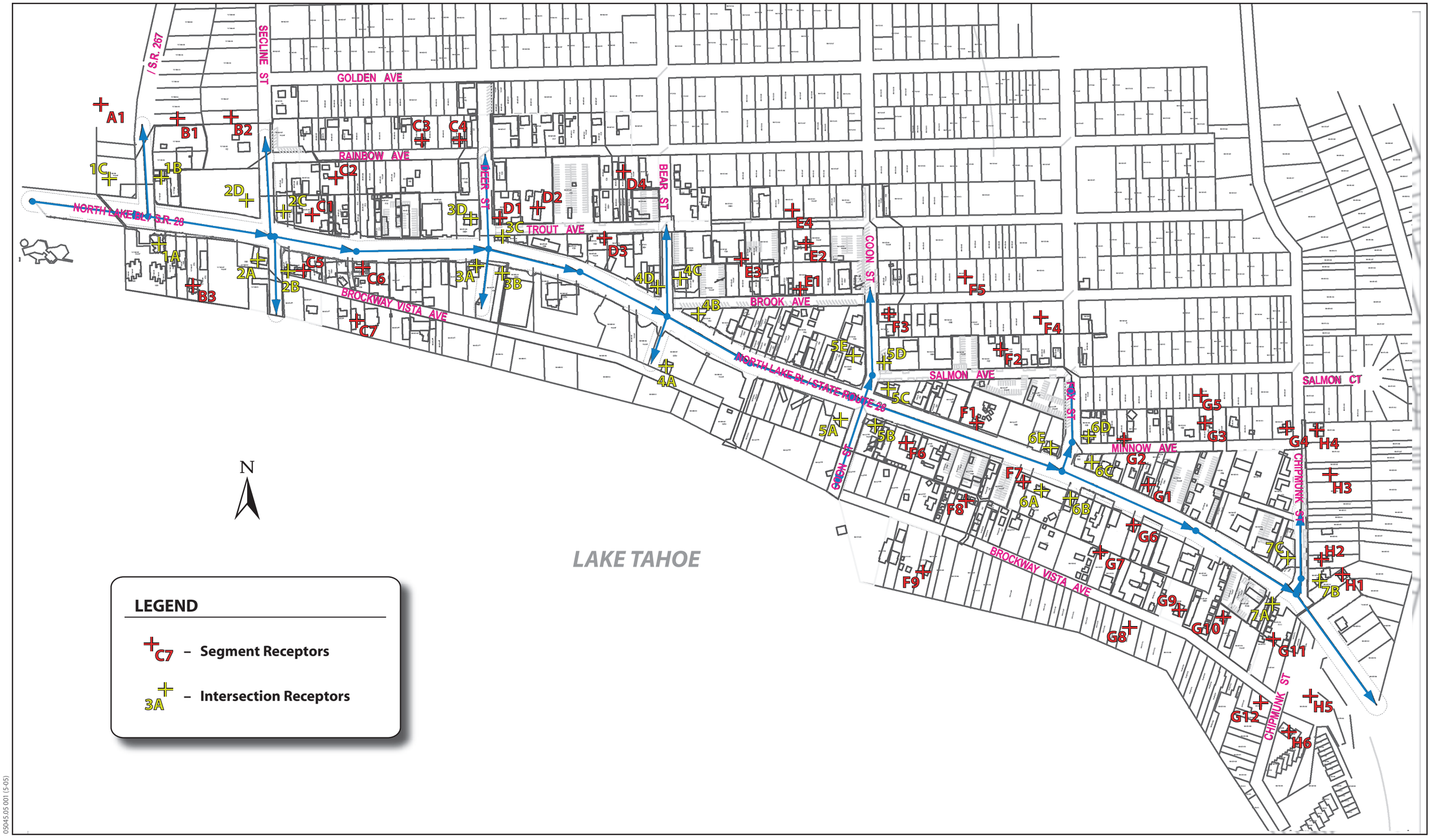
Criteria for Determining Significance

State CEQA Guidelines Appendix G states that a project would normally have a significant effect on the environment if it would:

- conflict with or obstruct implementation of the applicable air quality management plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

The guidelines further state that the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make these determinations. Emission thresholds used by the PCAPCD were obtained through consultation with PCAPCD staff (Vintze pers. comm.). The thresholds at which emissions are considered to have a significant effect on air quality throughout the PCAPCD are 82 pounds per day for ROG, NOx, and PM10, and 550 pounds per day for CO.

For this analysis, the following criteria are used to evaluate the significance of the impact:



05045.05 001 (5-05)

Jones & Stokes

Figure 1
Location of Carbon Monoxide Air Modeling Receptors

- Project emissions from construction activities or operations would exceed PCAPCD thresholds.
- If the proposed project is not listed in the local adopted RTP, TIP, or other 3-year transportation plan, the proposed project would be considered a nonconforming project in regards to the federal transportation conformity requirements.
- CO hotspot concentrations from vehicle trips would violate the federal or state ambient air quality standards for CO.
- Diesel emissions from project construction and operation would result in an increased health risk.
- Re-entrained fugitive dust from roadways would increase atmospheric phosphorus concentrations and contribute to phosphorus loading in Lake Tahoe from atmospheric deposition.
- The proposed project would result in substantial levels of odors.

Project Impacts

Impact 1: Generation of Construction-Related Emissions of Ozone Precursors (Reactive Organic Gases and Oxides of Nitrogen), Carbon Monoxide, and Particulate Matter in Excess of Placer County Air Pollution Control District Standards (Less than Significant with Mitigation Incorporated)

Construction activities for the proposed project would result in short-term impacts on ambient air quality in the area. Temporary construction emissions would result from grubbing/land clearing, grading/excavation, drainage/utilities/subgrade, and paving activities and construction worker commuting patterns. Pollutant emissions would vary daily, depending on the level of activity, specific operations, and prevailing weather. It is anticipated that construction activities would begin in 2007 and continue for approximately 24 to 36 months.

The Road Construction Emissions Model (Version 5.1) was used to estimate construction-related ozone precursors (ROG and NO_x), CO, and PM10 emissions from construction activities. It was assumed that construction activities would occur for 8 hours per day over a 12-month period. The total project length was assumed to be 0.9 mile, with a total acreage of 9 acres and a maximum of 1 acre disturbed per day. Construction activities were divided into separate phases and analyzed separately. Project significance is not a comparison of the sum of all construction phases to the PCAPCD threshold levels. Instead, if one phase of construction is found to have a significant impact, the entire project is considered to have a significant air quality impact.

The results of modeling for construction activities, summarized in Table 4, indicate that impacts from construction activities would not exceed the PCAPCD thresholds and are considered less than significant.

Table 4. Construction Emission Estimates

Construction Phase	ROG (pounds/day)	NO_X (pounds/day)	CO (pounds/day)	PM10 (pounds/day)
Grubbing/land clearing	9	57	44	8
Grading/excavation	9	60	48	8
Drainage/utilities/sub-grade	9	60	51	9
Paving	4	28	17	2
PCAPCD Construction Thresholds	82	82	550	82
Note: Emissions calculations based on Road Construction Emissions Model (Version 5.1)				

Although these impacts are considered less than significant, the PCAPCD recommends that projects with construction emissions below the threshold of 82 pounds per day should implement all feasible control measures recommended by the PCAPCD in order to reduce the project's contributions to significant cumulative air quality impacts and for the project to be consistent with the PCAPCD's air quality attainment plan. Mitigation Measure 1 implements this recommendation. In addition, Mitigation Measures 2 and 3 implement TRPA recommendations and Caltrans requirements, respectively.

Implementation of Mitigation Measures 1 and 3 would ensure also ensure that fugitive dust generated by construction equipment operating over exposed earth and the resuspension of dust from construction equipment operating on paved surfaces would be minimized.

Mitigation Measure 1: Implement All Applicable Placer County Air Pollution Control District Best-Available Mitigation Measures
The project proponent will implement the all feasible and applicable mitigation measures from the PCAPCD's best-available mitigation measures, which are summarized in Appendix A.

Mitigation Measure 2: Implement All Applicable Tahoe Regional Planning Agency Best Management Practices
The project proponent will implement the all feasible and applicable best management practices required by TRPA. Guidance is available from TRPA Best Management Practices Retrofit Program web page (2005a) and TRPA Erosion Control Team's general information web page (2005b) and BMP Contractors Notes (2005c).

Mitigation Measure 3: Implement California Department of Transportation Standard Specification 7-1.01F and Standard Specification 10
The project proponent will follow Caltrans Standard Specification 7-1.01F and Standard Specification 10, which address following the local air pollution control district's rules and dust control, respectively.

Impact 2: Generation of Operation-Related Emissions of Ozone Precursors (Reactive Organic Gases and Oxides of Nitrogen), Carbon Monoxide, and Particulate Matter in Excess of Placer County Air Pollution Control District Standards (Less than Significant)

Long-term air quality impacts are associated with motor vehicles operating on the roadway network, predominantly the SR 28 corridor. The EMFAC2002 model and traffic data provided by LSC Transportation Consultants were used to estimate operation-related emissions of ozone precursors (ROG and NO_x), CO, and PM10. As noted previously, the proposed project is not a traffic-generating project and would not result in any differences in traffic volumes throughout the project area between project and no-project conditions. The results of the calculations for project operations are summarized in Table 5. As indicated, emissions for future-year conditions would be well below the PCAPCD's thresholds for all alternatives; Alternative 2 would have the lowest emissions. Therefore, this impact is considered less than significant. No mitigation is required.

Impact 3: Nonconformance with State Implementation Plan (Less than Significant)

The proposed project is included in the 2004 Lake Tahoe Basin RTP and 2004 Federal TIP for the Lake Tahoe Region. The U.S. Department of Transportation and the EPA developed guidance for determining conformity of transportation plans, programs, and projects in November 1993 in the Transportation Conformity Rule (40 Code of Federal Regulations 51, 93). The demonstration of conformity to the SIP is the responsibility of the local MPO (in this case, the TRPA), as well as preparation of RTPs and associated conformity analysis.

Any project listed in an RTP must demonstrate conformity with the SIP. The SIP, which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Air quality modeling has been conducted showing that emissions associated with the Lake Tahoe Basin RTP are within the allowable emission budgets for ozone precursors, and is in conformity with the SIP. Because the proposed project is listed in the RTP, which is in conformity with the SIP, the proposed project is a conforming project for ozone precursors. This impact is considered less than significant. No mitigation is required.

Impact 4: Generation of Carbon Monoxide Hotspot Emissions in Excess of the Federal or State Standards (Less than Significant)

Increases of CO concentrations at locations near congested intersections affected by the proposed project were modeled with the CALINE4 dispersion model. The modeling was performed at the intersections of SR 28/SR 267, SR 28/Secline Street, SR 28/Deer Street, SR 28/Bear Street, SR 28/Coon Street, SR 28/Fox Street, and SR 28/Chipmunk Street using the highest winter peak hour traffic data. The conditions modeled were existing, 2008 with project, and 2028 with project. It should be noted that the existing conditions had the highest modeled concentrations; emissions under future conditions are anticipated to be lower because of continuing improvements in engine technology and the retirement of older, higher-emitting vehicles. Modeled CO concentrations plus background CO levels from the nearest monitoring station are presented in Table 6. As shown, emissions of CO hotspots are not anticipated to exceed the federal or state

1- and 8- hour standards. Therefore, this impact is considered less than significant. No mitigation is required.

Impact 5: Exposure of Sensitive Receptors to Elevated Levels of Diesel Exhaust and an Increased Health Risk (Less than Significant)
It is anticipated that construction activities would continue for approximately 1 year in varying locations. Assessment of cancer risk is typically based on a 70-year exposure period. Construction activities are sporadic, transitory, and short-term in nature; once construction activities cease, so do emissions from construction activities. Because exposure to diesel exhaust will be much less than 70 years, construction of the proposed project is not anticipated to result in an elevated cancer risk to exposed persons. Therefore, the diesel risks associated with construction activities are considered less than significant. No mitigation is necessary.

Guidance provided by the ARB indicates that elevated health risks from operational exposure to diesel exhaust is associated primarily with facilities have substantial diesel exhaust emissions, including truck stops, warehouse/distribution centers, large retail or industrial facilities, high-volume transit centers, schools with high volumes of bus traffic, high-volume highways, and high-volume arterials/roadways. The proposed project does not fall under any of these land use types. In addition, project operations are not anticipated to result in increased health risks from exposure to diesel exhaust from vehicles because the proposed project would not increase the number of truck trips or truck traffic throughputs in the vicinity of the project area. Therefore, this impact is considered less than significant. No mitigation is required.

Impact 6: Atmospheric Deposition of Phosphorus from Re-Entrained Roadway Fugitive Dust into Lake Tahoe (Less than Significant)
The deposition of phosphorus into Lake Tahoe is a concern for the lake ecosystem. A number of factors have been identified as contributors to poor water quality. Among them, it has been demonstrated that concentrations of phosphorus in Lake Tahoe are closely related to its capacity to support algal populations (i.e., as concentrations of phosphorus in the lake increase, algal growth may increase if all other factors remain equal). This is a primary concern for Lake Tahoe because its clarity and visual quality are unique and renowned. Within the region, atmospheric deposition of phosphorus from re-entrained fugitive dust into Lake Tahoe is a concern. Because of heavy winter sanding operations for snow control in the area, the roadway surfaces in the area contain higher levels of sand and gravel than other areas. This can result in higher levels of localized re-entrained fugitive dust as vehicles travel over the roadways and break the sand and gravel into ever smaller dust that is sufficient for aerial transport. This dust can be re-entrained into the air from wind blowing over the roadways and vehicles traveling over the roadways.

It is not anticipated that proposed project would result in an increased contribution to the atmospheric deposition of phosphorus in Lake Tahoe from re-entrained fugitive dust. The physical features associated with the proposed project would reduce the total area of roadway, which would reduce the amount of sand and gravel required for snow control in winter. This would in turn reduce

Table 5. Motor Vehicle Emissions

Roadway	From	To	Existing Year (2002) (Pounds Per Day)						Alternatives 1 and 3 (2028) (Pounds Per Day)				
			ROG	NO_X	CO	PM10	PM2.5		ROG	NO_X	CO	PM10	PM2.5
SR 28	Beach Street	SR 267	7.9	25.2	146.9	0.6	0.4		0.8	5.1	18.2	0.7	0.5
	SR 267	Secline Street	3.8	12.1	70.3	0.3	0.2		0.4	2.4	8.7	0.3	0.2
	Secline Street	Deer Street	6.4	20.3	118.0	0.5	0.3		0.6	4.4	15.7	0.6	0.5
	Deer Street	Bear Street	5.4	17.2	100.0	0.4	0.3		0.6	3.6	12.8	0.5	0.4
	Bear Street	Coon Street	6.1	19.4	112.8	0.4	0.3		0.7	4.1	14.7	0.6	0.4
	Coon Street	Fox Street	5.6	17.6	102.8	0.4	0.3		0.6	3.7	13.1	0.5	0.4
	Fox Street	Chipmunk Street	6.7	21.2	123.3	0.5	0.3		0.7	4.3	15.5	0.6	0.4
	Chipmunk Street	Beaver Street	3.5	11.1	64.4	0.3	0.2		0.4	2.3	8.1	0.3	0.2
Total			**45.4**	**143.9**	**838.5**	**3.3**	**2.3**		**4.9**	**30.0**	**106.7**	**4.0**	**3.0**

Roadway	From	To	Alternative 2 (2028) (Pounds Per Day)						Alternative 4 (2028) (Pounds Per Day)				
			ROG	NO_X	CO	PM10	PM2.5		ROG	NO_X	CO	PM10	PM2.5
SR 28	Beach Street	SR 267	0.7	4.8	17.0	0.6	0.4		0.9	5.2	18.4	0.7	0.5
	SR 267	Secline Street	0.3	2.3	8.1	0.3	0.2		0.4	2.5	8.8	0.3	0.2
	Secline Street	Deer Street	0.5	3.8	13.6	0.5	0.3		0.7	4.2	14.8	0.6	0.4
	Deer Street	Bear Street	0.4	3.3	11.5	0.4	0.3		0.6	3.5	12.5	0.5	0.3
	Bear Street	Coon Street	0.5	3.7	13.0	0.4	0.3		0.7	4.0	14.1	0.5	0.4
	Coon Street	Fox Street	0.5	3.3	11.9	0.4	0.3		0.6	3.6	12.9	0.5	0.4
	Fox Street	Chipmunk Street	0.5	4.0	14.2	0.5	0.3		0.7	4.4	15.4	0.6	0.4
	Chipmunk Street	Beaver Street	0.3	2.1	7.4	0.3	0.2		0.4	2.3	8.1	0.3	0.2
Total			**3.7**	**27.3**	**96.8**	**3.3**	**2.3**		**4.9**	**29.6**	**104.9**	**3.9**	**2.9**

Table 6. Carbon Monoxide Modeling Concentrations Results

Intersection	Existing Conditions (Parts Per Million)		Alternatives 1 and 3 (Parts Per Million)				Alternative 2 (Parts Per Million)				Alternative 4 (Parts Per Million)			
			2008		2028		2008		2028		2008		2028	
	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.
1A	2.9	1.7	2.3	1.3	1.4	0.8	2.3	1.3	1.5	0.8	2.3	1.3	1.4	0.8
1B	2.5	1.4	2.1	1.2	1.4	0.8	2.1	1.2	1.5	0.8	2.1	1.2	1.4	0.8
1C	2.8	1.6	2.2	1.3	1.4	0.8	2.2	1.3	1.5	0.8	2.2	1.3	1.4	0.8
2A	3.0	1.7	2.4	1.4	1.4	0.8	2.4	1.4	1.4	0.8	2.4	1.4	1.4	0.8
2B	2.9	1.7	2.3	1.3	1.4	0.8	2.3	1.3	1.4	0.8	2.3	1.3	1.4	0.8
2C	2.9	1.7	2.4	1.4	1.4	0.8	2.4	1.4	1.4	0.8	2.4	1.4	1.4	0.8
2D	2.8	1.6	2.3	1.3	1.4	0.8	2.3	1.3	1.4	0.8	2.3	1.3	1.4	0.8
3A	3.1	1.8	2.5	1.4	1.5	0.8	2.5	1.4	1.5	0.8	2.5	1.4	1.5	0.8
3B	2.7	1.6	2.3	1.3	1.4	0.8	2.2	1.3	1.4	0.8	2.3	1.3	1.4	0.8
3C	3.1	1.8	2.6	1.5	1.5	0.8	2.5	1.4	1.5	0.8	2.6	1.5	1.5	0.8
3D	2.5	1.4	2.1	1.2	1.4	0.8	2.0	1.1	1.4	0.8	2.1	1.2	1.4	0.8
4A	2.5	1.4	1.8	1.0	1.3	0.7	1.8	1.0	1.3	0.7	1.8	1.0	1.3	0.7
4B	3.8	2.2	2.5	1.4	1.5	0.8	2.4	1.4	1.5	0.8	2.5	1.4	1.5	0.8
4C	2.8	1.6	2.1	1.2	1.4	0.8	2.0	1.1	1.4	0.8	2.1	1.2	1.4	0.8
4D	3.3	1.9	2.3	1.3	1.4	0.8	2.2	1.3	1.4	0.8	2.3	1.3	1.4	0.8
5A	2.1	1.2	2.1	1.2	1.4	0.8	2.1	1.2	1.4	0.8	2.1	1.2	1.4	0.8
5B	2.1	1.2	2.1	1.2	1.4	0.8	2.2	1.3	1.4	0.8	2.1	1.2	1.4	0.8
5C	2.2	1.3	2.2	1.3	1.4	0.8	2.3	1.3	1.4	0.8	2.2	1.3	1.4	0.8
5D	1.8	1.0	1.8	1.0	1.4	0.8	1.9	1.1	1.3	0.7	1.8	1.0	1.3	0.7
5E	1.9	1.1	1.9	1.1	1.4	0.8	2.0	1.1	1.4	0.8	1.9	1.1	1.4	0.8
6A	2.0	1.1	2.0	1.1	1.4	0.8	2.2	1.3	1.4	0.8	2.0	1.1	1.4	0.8
6B	2.1	1.2	2.1	1.2	1.4	0.8	2.3	1.3	1.4	0.8	2.1	1.2	1.4	0.8
6C	2.3	1.3	2.3	1.3	1.4	0.8	2.5	1.4	1.4	0.8	2.3	1.3	1.4	0.8
6D	1.9	1.1	1.9	1.1	1.4	0.8	2.0	1.1	1.4	0.8	1.9	1.1	1.4	0.8
6E	2.4	1.4	2.4	1.4	1.5	0.8	2.6	1.5	1.5	0.8	2.4	1.4	1.5	0.8
7A	2.1	1.2	2.1	1.2	1.4	0.8	2.2	1.3	1.4	0.8	2.1	1.2	1.4	0.8
7B	2.1	1.2	2.1	1.2	1.4	0.8	2.2	1.3	1.4	0.8	2.1	1.2	1.4	0.8
7C	2.0	1.1	2.0	1.1	1.4	0.8	2.1	1.2	1.4	0.8	2.0	1.1	1.4	0.8

Table 6. Continued.

Intersection	Existing Conditions (Parts Per Million)		Alternatives 1 and 3 (Parts Per Million)				Alternative 2 (Parts Per Million)				Alternative 4 (Parts Per Million)			
			2008		2028		2008		2028		2008		2028	
	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.
A1	2.2	1.3	1.9	1.1	1.3	0.7	1.9	1.1	1.4	0.8	1.9	1.1	1.3	0.7
B1	2.0	1.1	1.7	1.0	1.3	0.7	1.7	1.0	1.4	0.8	1.7	1.0	1.3	0.7
B2	1.9	1.1	1.7	1.0	1.2	0.7	1.7	1.0	1.3	0.7	1.7	1.0	1.2	0.7
B3	2.3	1.3	1.9	1.1	1.3	0.7	1.9	1.1	1.3	0.7	1.9	1.1	1.3	0.7
C1	2.9	1.7	2.3	1.3	1.4	0.8	2.3	1.3	1.4	0.8	2.3	1.3	1.4	0.8
C2	2.2	1.3	1.8	1.0	1.3	0.7	1.8	1.0	1.3	0.7	1.8	1.0	1.2	0.7
C3	1.9	1.1	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
C4	1.9	1.1	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
C5	3.0	1.7	2.4	1.4	1.4	0.8	2.4	1.4	1.4	0.8	2.4	1.4	1.4	0.8
C6	3.6	2.1	2.8	1.6	1.5	0.8	2.8	1.6	1.5	0.8	2.8	1.6	1.5	0.8
C7	2.2	1.3	1.9	1.1	1.3	0.7	1.9	1.1	1.3	0.7	1.9	1.1	1.2	0.7
D1	2.4	1.4	2.0	1.1	1.4	0.8	2.0	1.1	1.4	0.8	2.0	1.1	1.4	0.8
D2	2.2	1.3	1.9	1.1	1.3	0.7	1.8	1.0	1.3	0.7	1.9	1.1	1.3	0.7
D3	2.4	1.4	2.0	1.1	1.4	0.8	1.9	1.1	1.4	0.8	2.0	1.1	1.3	0.7
D4	1.9	1.1	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
E1	2.2	1.3	1.7	1.0	1.3	0.7	1.7	1.0	1.3	0.7	1.7	1.0	1.2	0.7
E2	2.0	1.1	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
E3	2.2	1.3	1.7	1.0	1.3	0.7	1.7	1.0	1.3	0.7	1.7	1.0	1.3	0.7
E4	1.9	1.1	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
F1	2.4	1.4	2.4	1.4	1.5	0.8	2.7	1.6	1.5	0.8	2.5	1.4	1.5	0.8
F2	1.6	0.9	1.6	0.9	1.2	0.7	1.7	1.0	1.2	0.7	1.6	0.9	1.2	0.7
F3	1.6	0.9	1.6	0.9	1.3	0.7	1.7	1.0	1.2	0.7	1.6	0.9	1.2	0.7
F4	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
F5	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7
F6	2.0	1.1	2.0	1.1	1.4	0.8	2.2	1.3	1.4	0.8	2.0	1.1	1.4	0.8
F7	2.1	1.2	2.1	1.2	1.4	0.8	2.3	1.3	1.4	0.8	2.1	1.2	1.4	0.8
F8	1.7	1.0	1.7	1.0	1.3	0.7	1.8	1.0	1.3	0.7	1.7	1.0	1.3	0.7
F9	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7

Table 6. Continued.

Intersection	Existing Conditions (Parts Per Million)		Alternatives 1 and 3 (Parts Per Million)				Alternative 2 (Parts Per Million)				Alternative 4 (Parts Per Million)			
			2008		2028		2008		2028		2008		2028	
	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.	1 Hr.	8 Hrs.
G1	2.2	1.3	2.2	1.3	1.4	0.8	2.3	1.3	1.4	0.8	2.2	1.3	1.4	0.8
G2	1.8	1.0	1.8	1.0	1.3	0.7	1.9	1.1	1.3	0.7	1.8	1.0	1.3	0.7
G3	1.6	0.9	1.6	0.9	1.2	0.7	1.7	1.0	1.2	0.7	1.6	0.9	1.2	0.7
G4	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7
G5	1.6	0.9	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
G6	2.2	1.3	2.2	1.3	1.4	0.8	2.4	1.4	1.4	0.8	2.2	1.3	1.4	0.8
G7	1.7	1.0	1.7	1.0	1.3	0.7	1.8	1.0	1.3	0.7	1.7	1.0	1.3	0.7
G8	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7
G9	1.6	0.9	1.6	0.9	1.2	0.7	1.7	1.0	1.2	0.7	1.6	0.9	1.2	0.7
G10	1.7	1.0	1.7	1.0	1.3	0.7	1.8	1.0	1.3	0.7	1.7	1.0	1.3	0.7
G11	1.7	1.0	1.7	1.0	1.3	0.7	1.8	1.0	1.3	0.7	1.7	1.0	1.3	0.7
G12	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7
H1	1.8	1.0	1.8	1.0	1.3	0.7	1.9	1.1	1.3	0.7	1.8	1.0	1.3	0.7
H2	1.8	1.0	1.8	1.0	1.4	0.8	1.9	1.1	1.4	0.8	1.9	1.1	1.4	0.8
H3	1.6	0.9	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7	1.6	0.9	1.2	0.7
H4	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7
H5	1.6	0.9	1.6	0.9	1.3	0.7	1.6	0.9	1.3	0.7	1.6	0.9	1.3	0.7
H6	1.5	0.8	1.5	0.8	1.2	0.7	1.6	0.9	1.2	0.7	1.5	0.8	1.2	0.7

Notes: Background concentrations of 1.2 and 0.7 parts per million (ppm) were added to the modeling 1- and 8-hour results, respectively. The federal 1- and 8-hour standards are 35 and 9 ppm, respectively. The state 1- and 8-hour standards are 20 and 6 ppm, respectively.

the amount of re-entrained fugitive dust in the immediate project vicinity. In addition, the narrowing of the roadways and installation of roundabouts would reduce speeds during peak hours on SR 28, which would reduce the amount of re-entrained roadway dust in the project area because lower amounts of re-entrained roadway dust are associated with lower speeds. Overall, the proposed project would not increase the amount of re-entrained fugitive dust, and consequently would not contribute to the atmospheric deposition of phosphorus in Lake Tahoe. This impact is considered less than significant. No mitigation is required.

Impact 7: Generation of Significant Levels of Odors (Less than Significant) Diesel emissions from construction equipment and volatile organic compounds from paving activities may create offsite odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Operation of the proposed project is not anticipated to generate any objectionable odors that affect a substantial number of people. This impact is considered less than significant. No mitigation is necessary.

References Cited

Printed References

Benson, P. 1989. *CALINE4—A Dispersion Model for Predicting Air Pollutant Concentrations near Roadways.* November. (FHWA/CA/TL-84/15.) Sacramento, CA: California Department of Transportation.

California Air Resources Board. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* October. Sacramento, CA.

———. 2003. Proposed Amendments to the Area Designation Criteria and Area Designations for State Ambient Air Quality Standards and Maps of Area Designations for State and National Ambient Air Quality Standards. December 5. Sacramento, CA.

———. 2004. Top 4 Measurements and Days Above the Standard. Last Revised: June 7, 2004. Available: <http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start>. Accessed: April 25, 2005.

Garza, V. J., P. Graney, and D. Sperling. 1997. *Transportation Project-Level Carbon Monoxide Protocol.* December. Davis, CA.

LSC Transportation Consultants, Inc. 2003. *Kings Beach Commercial Core Traffic Study.* November 7. Tahoe City, CA. Prepared for Placer County Department of Public Works, Auburn, CA.

Tahoe Regional Planning Agency. 2005a. Best Management Practices Retrofit Program. Available: <http://www.trpa.org/BMPInfo/bmp.html>. Accessed: May 23, 2005.

———. 2005b. TahoeBMP: General. Available: <http://www.tahoebmp.org/general.aspx>. Accessed: May 23, 2005.

———. 2005c. BMP Contractors Notes. Available: <http://www.tahoebmp.org/bmp_pdfs/BMP_Contractors_Notes.pdf>. Accessed: May 23, 2005.

Transportation Research Board. 2000. *Highway Capacity Manual.* Washington, DC.

U.S. Environmental Protection Agency. 2005. Air Data. Last Revised: December 16, 2004. Available: <http://www.epa.gov/air/data/reports.html>. Accessed: April 25, 2005.

Personal Communications

Quashnick, Jennifer. Air Quality & Noise Program Manager/Associate Planner, Tahoe Regional Planning Agency, Long Range Planning Division, Stateline, NV. March 14, 2005—email. June 10, 2004—memorandum.

Shaw, Gordon. President, LSC Transportation Consultants, Inc., Tahoe City, CA. January 21, 2005, January 21, 2005, and February 24, 2005—memoranda. April 1, 2005—email.

Vintze, Dave. Associate Air Quality Planner, Placer County Air Pollution Control District, Auburn, CA. January 31, 2002—telephone conversation.

Appendix A

Placer County Best Available Mitigation Measures

Construction

Projects that are estimated to result in daily construction emissions greater than 82 pounds per day for any pollutant will result in significant air quality impacts and should be required to submit a Construction Emission/Dust Control Plan (Plan) to the District for review and approval. At a minimum, the Plan should include measures 1-6 listed below and all feasible measures listed under "Construction Activity." Projects with construction emissions below 82 pounds per day should implement all feasible measures to reduce their contributions to significant cumulative air quality impacts and for the project to be consistent with the District's Air Quality Attainment Plan.

1. Construction equipment exhaust emissions shall not exceed District Rule 202 Visible Emission limitations.
2. The applicant shall submit to the District and receive approval of a Construction Emission / Dust Control Plan prior to groundbreaking.
3. The prime contractor shall submit to the District a comprehensive inventory (i.e. make, model, year, emission rating) of all the heavy-duty off-road equipment (50 horsepower of greater) that will be used an aggregate of 40 or more hours for the construction project. District personnel, with assistance from the California Air Resources Board, will conduct initial Visible Emission Evaluations of all heavy-duty equipment on the inventory list.
4. An enforcement plan shall be established to weekly evaluate project-related on-and-off- road heavy-duty vehicle engine emission opacities, using standards as defined in California Code of Regulations, Title 13, Sections 2180 - 2194. An Environmental Coordinator, CARB-certified to perform Visible Emissions Evaluations (VEE), shall routinely evaluate project related off-road and heavy duty on-road equipment emissions for compliance with this requirement. Operators of vehicles and equipment found to exceed opacity limits will be notified and the equipment must be repaired within 72 hours.

5. Construction contracts should stipulate that at least 20% of the heavy-duty off-road equipment included in the inventory be powered by CARB certified off-road engines, as follows:

175 hp – 750 hp	1996 and newer engines
100 hp – 174 hp	1997 and newer engines
50 hp – 99 hp	1998 and newer engines

   In lieu of or in addition to this requirement, an applicant can use other measures to reduce particulate matter and nitrogen oxide emissions from their project through the use of emulsified diesel fuel and or particulate matter traps. The District should be contacted to discuss this measure.

6. No open burning of removed vegetation during infrastructure improvements. Vegetative material should be chipped or delivered to waste to energy facilities.
7. Develop trip reduction plan to achieve 1.5 AVR for construction employees.
8. Clean earth moving construction equipment with water once per day.
9. Spread soil binders on unpaved roads and employee/equipment parking areas.
10. Apply approved chemical soil stabilizers according to manufacturers" specifications, to all-inactive construction areas (previously graded areas which remain inactive for 96 hours).
11. Reestablish ground cover on the construction site as soon as possible through seeding and watering.
12. Implement or contribute to a native tree-planting program to offset the loss of existing trees at the construction site.
13. Employ construction activity management techniques, such as: extending the construction period outside the ozone season of May through October; reducing the number of pieces used simultaneously; increasing the distance between emission sources; reducing or changing the hours of construction; and scheduling activity during off-peak hours.
14. Wet broom or wash streets if silt is carried over to adjacent public thoroughfares.
15. Reduce traffic speeds on all unpaved surfaces to 15 miles per hour or less.
16. Suspend all grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour and dust is impacting adjacent properties.
17. Install wheel washers or wash all trucks and equipment leaving the site.
18. Minimize idling time to 10 minutes.
19. An operational water truck shall be onsite at all times. Apply water to control dust as needed to prevent dust impacts offsite.
20. Use low sulfur fuel for stationary construction equipment.

21. Utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.
22. Use low emission on-site stationary equipment.
23. Provide a flag person to guide traffic properly and ensure safety at construction sites.
24. Schedule operations affecting traffic for off-peak hours.
25. Develop a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service.
26. Minimize obstruction of through-traffic lanes.

Operational

The following is a list of mitigation measures that have been identified by the District to reduce a project's long-term operational impact on local and regional air quality. All projects should implement those measures that are logical and feasible for their project to implement due to the existing severe nonattainment designation in Placer County for federal and State ozone standards. Projects that cannot implement sufficient onsite measures to reduce project impacts, can participate in the District's offsite mitigation program. Please see measure number 101 for details on the District's offsite mitigation program. Implementation of these measures will ensure that projects are consistent with the District's Air Quality Attainment Plan and local land use plans.

27. Tree planting of California native species in excess of that already required.
28. Landscape with native drought-resistant species (plants, trees and bushes) to reduce the demand for gas powered landscape maintenance equipment.
29. Use of low VOC coatings per District Rule 218 Architectural Coatings.
30. Site design to minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.
31. Require development practices, which maximize energy conservation.
32. Improve the thermal integrity of buildings, and reduce the thermal load with automated time clocks or occupant sensors.
33. Introduce window glazing, wall insulation, and efficient ventilation methods.
34. Introduce efficient heating and other appliances, such as water heaters, cooking equipment, refrigerators, furnaces and boiler units.
35. Incorporate appropriate passive solar design and solar heaters.

36. Use devices that minimize the combustion of fossil fuels.
37. Capture waste heat and re-employ it in nonresidential buildings.
38. Electrical outlets shall be installed on the exterior walls of both the front and back of a residence or all commercial buildings to promote the use of electric landscape maintenance equipment.
39. Install a gas outlet in the backyard for gas burning barbecues.
40. Install a gas outlet for use with outdoor cooking appliances, such as a gas barbecue.
41. Install a gas outlet with ceramic logs in any proposed fireplaces, including outdoor recreational fireplaces or pits.
42. Install low nitrogen oxide (NOx) hot water heaters.(Beyond District Rule 246 Requirements)
43. Install electric vehicle recharging circuits in residential garages / parking lots.
44. Install electric vehicle charging raceways in residential garages.
45. Prohibit gas powered landscape maintenance equipment within developments.
46. Purchase battery powered or electric landscape maintenance equipment for new residences.
47. Require landscape maintenance companies use battery powered or electric equipment.
48. Create / increase buffer zones between a sensitive receptor and pollution source.
49. Configure parking to minimize traffic interference.
50. Schedule goods movement for off-peak traffic hours.
51. Synchronize traffic signals.
52. Provide adequate ingress and egress at entrances to public facilities to minimize vehicle idling at curbside.
53. Provide dedicated turn lanes as appropriate.
54. Join a local Transportation Management Association (TMA) and prepare employer-based trip reduction plans.
55. Establish telecommuting programs, alternate work schedules, and satellite work centers.
56. Design parking areas with less emphasis on “convenience.”
57. Include a limited number of parking spaces in project design.
58. Include wide parking spaces or vanpool only spaces to accommodate vanpool vehicles.

59. Develop vehicle and bicycle all day parking lots near rail stations, transit stops, and freeway access points.
60. Construction/enhancement of a Park and Ride lot.
61. Parking pricing strategies, such as charging parking lot fees to low occupancy vehicles.
62. Provide preferential parking for those who rideshare.
63. Provide funds for on line computer rideshare matching.
64. Provide ridesharing information in a homeowner's association package.
65. Site design to maximize telecommunication including an appropriate network infrastructure.
66. Provide satellite work offices when appropriate. Applicable to office/industrial and educational institutions.
67. Design/establish telecommuting programs for office/industrial complexes.
68. Offer low cost financing to employees for the purchase of telecommuting equipment, or lend company-owned equipment.
69. Design "Shop by Telephone" or "Shop-by-Computer" services. Applicable to shopping centers and retail facilities.
70. Provide individual private telephones for patients at medical facilities, which allows for "visits without trips."
71. Purchase abandoned railroad rights-of-way for future transit line, bikeway or hiking use(s).
72. Contribute to an area transit fund to help build, maintain, and enhance transit services/facilities/amenities.
73. Site design to maximize access to existing transit lines.
74. Street design to accommodate bus travel.
75. Street design to maximize pedestrian access to transit stops, including access from residential cul-de-sacs to collector and arterial streets.
76. Site design to include bus shelters at transit access points.
77. Provide additional lighted transit shelters and multimodal transfer stations for transit users.
78. Construction of transit facility/amenity(bus shelters, bicycle lockers/racks, etc.) for existing public and private transit.
79. Provision for transit-use incentives such as subsidized transit passes, accommodation of "unusual" work schedules to allow for transit schedules. Applies to office/industrial, educational institutions, and resorts/hotels.
80. "Validation" of a transit ticket to provide free return trip. Applies to shopping centers, hospitals/medical facilities, and retail facilities.
81. Sell transit passes. Applies to retail facilities, educational institutions, resorts/hotels, and office/industrial complexes.

82. An employer subsidized free or reduced transit fares for midday central business district trips.
83. Free transfers between all shuttles and transit.
84. Subsidized school bus service.
85. A subsidy of added transit services.
86. An employer subsidized shuttle service to connect to existing transit sites.
87. Operation of a shuttle bus to shopping, health care, public services sites and other nearby trip attractors to reduce automobile use.
88. Establish delivery services. Applicable to retail facilities (frequent use), shopping centers, and restaurants.
89. Site design to maximize bicycle access to and within the project and/or provide bicycle parking/lockers.
90 An employer/developer provided locker room/showers to employees whom bicycle.
91. Include Class 2 bicycle lanes in new developments.
92. Develop or improve bicycle/pedestrian paths between destinations using public and/or utility rights-of-way.
93. Develop or improve access by bicycle, wheelchair or pedestrian traffic to existing major destinations in city or region. For example, schools, employment centers, shopping, recreation, and parks.
94. Provide secure bicycle storage at public parking facilities.
95. Contribute funding toward the purchase and operation of air quality monitoring equipment.
96. Provide a location for air monitoring equipment.
97. Require mixed-use development in order to achieve a balance of commercial, employment, and housing options within the project site or its immediate environment.
98. Provide higher density land uses around activity centers, transportation nodes and transit corridors.
99. Only U.S. EPA Phase II certified woodburning devices shall be allowed in single-family residences. The emission potential from each residence shall not exceed 7.5 grams per hour.
100. Woodburning or Pellet appliances shall not be permitted in multi-family developments. Only natural gas or propane fired “fireplace” appliances are permitted.
101. If a project cannot implement sufficient on-site measures to reduce its long-term operational emissions, the project could implement an offsite mitigation program to achieve the required emission reduction. Offsite mitigation strategies are modeled after existing heavy duty nitrogen oxide reduction programs and include retrofitting existing on-road or off-road

heavy vehicles/equipment with cleaner burning engines, retrofitting or purchasing new low emission agriculture pumps, transit vehicles, CNG fueling infrastructure or replacing non-EPA certified woodstoves with new EPA certified units. The design of the offsite mitigation program would depend on the type and amount of emission reductions needed.

In lieu of each individual project implementing their own offsite mitigation program, an applicant can choose to pay an equivalent amount of money into the District's Air Quality Mitigation Fund. The District provides monetary incentives to sources of air pollutant emissions within the projects general vicinities that are not required by law to reduce their emissions. Therefore, the emission reductions are real, quantifiable and implement provisions of the 1994 State Implementation Plan. The offsite mitigation program has been implemented by a number of projects in Placer County.